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(54) Rubbish bag

(57) Nowadays it is commonplace to line rubbish bins with plastics bags before depositing rubbish in them. This not only keeps the bin clean but also allows the rubbish deposited in the bag to be removed and disposed of easily when the bin is full. Such a plastics bag (1) includes at or towards its open end a strip of elastic (4) connected to the bag (1) at two spaced apart portions (5). The elastic strip (4) extends between the spaced apart portions (5) extending over an extent of half the periphery or less of the bag (1) and is substantially relaxed when the open end (2) of the bag (4) is opened to its maximum extent. To use such a bag it is placed in a bin (6) and the open neck of the bag folded over the open end of the bin (6). The strip of elastic (4) is then pulled over and across the open end of the bin (6) to engage the folded over neck portion (7) on the opposite side of the bag (1).

Fig.1.

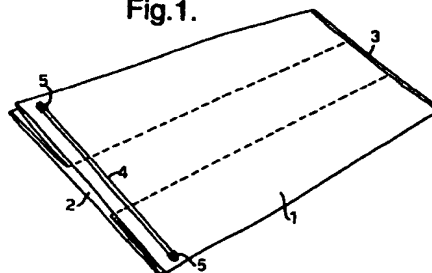
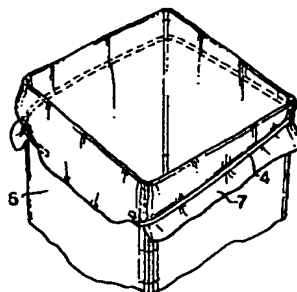


Fig.4.



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Description

[0001] Nowadays it is commonplace to line rubbish bins with plastics bags before depositing rubbish in them. This not only keeps the bin clean but also allows the rubbish deposited in the bag to be removed and disposed of easily when the bin is full. A perennial problem with this arrangement is the requirement to hold the open neck of the bag onto the top rim of the bin. If the open neck of the bag becomes displaced, rubbish thrown into the bin tends to collect between the outside of the bag and the bin. This leads to the bin getting dirty and it being difficult to remove the bag.

[0002] Very many proposals have been made over the years to overcome this problem by using clips and clamping arrangements on the rim of the bin to hold the open neck of the bag or by providing an elasticated neck to the bag so that it grips the top rim of the bin. In spite of these very many proposals none have achieved significant commercial success. One of the proposals most likely to be able to be put into commercial production is discussed in EP-B-0542889. This arrangement describes a gusseted and non-gusseted bag which includes at least one strip of elastic fixed to the neck of the bag at two spaced apart points with the relaxed length of the elastic extending between these points being shorter than the spacing of the two points on the bag. Thus, this provides the bag with an open neck which is resiliently extensible so that it will grip the top rim of an associated bin to hold the bag in place. The elastic strip may extend across the gusset of a gusseted bag so that it is not stretched until the bag is opened or it may extend along a portion of the side wall of the bag. In this latter case the side wall tends to crumple up so making the empty unused bags difficult to handle and package. This specification also discloses, especially in the case of an elastic strip extending across a gusseted bag, that it is possible to use the elastic strip as a tie to close a filled bag by wrapping the elastic strip around its gathered together neck.

[0003] According to this invention, a plastics bag includes at or towards its open end a strip of elastic connected to the bag at two spaced apart portions, the elastic strip extending between the spaced apart portions extending over an extent of half the periphery or less of the bag and being substantially relaxed when the open end of the bag is opened to its maximum extent.

[0004] The elastic strip only extends around part of the neck of the bag and, for example, extends all or only part way along one side of the bag.

[0005] To use a bag in accordance with this invention the bag is placed in a bin and the open neck of the bag folded over the open end of the bin. The strip of elastic is then pulled over and across the open end of the bin to engage the folded over neck portion on the opposite side of the bag. Where the elastic strip has a length of half, or approaching half, of the periphery of the neck of the bag it is preferred that the elastic strip is

formed into a complete loop which is then placed completely to surround the folded over neck of the bag. Where the strip is relatively short, for example, a quarter of the length of the periphery of the neck of the bag, it is preferred that the strip only extends around the remainder of the periphery of the folded over end of the neck of the bag with the exception of that between the direct path between the connection points of the elastic strip.

[0006] The connection points of the elastic strip may be enclosed in a flap or hem of the bag, particularly where the connection points being sandwiched between the layers of the bag assists in fixing them to the bag. If all of the elastic strip is enclosed in a hem an aperture or recess is provided to enable the elastic strip to be grasped and pulled over the open end of the bin. The elastic strip may be attached to the inside or the outside surface of the bag. When the strip is attached to the outside of the bag it may over lie an aperture or recess in the side wall of the bag so that when the top of the bag is turned over the rim of a bin, the elastic strip can be accessed through the aperture or recess. However this is not necessary because an elastic strip mounted on the outside of the bag, and hence the inside of the turned over top of the bag, can easily be pulled out from underneath the turned over top of the bag and then wrapped around it.

[0007] The connection points of the elastic strip are preferably attached by hot melt adhesive and particularly hot melt adhesive of the reactive or the rubbery elastomer type such as that known as Dispomelt® 322 made by National Starch and Chemical Company of 10 Funderne Avenue, New Jersey 08807-3300, USA. Alternatively the connection points of the strip may be welded or adhered by other means to the bag or may be mechanically connected to the bag by being stapled or stitched to it, by being trapped in folds of the bag or by being threaded through a hole in the bag. In the latter cases the strip may be knotted or be held by an enlarged clamp or clip. For some constructions of bag it is convenient to have the elastic strip extending along the full extent of one side of the bag. If such a length of elastic is too long to provide sufficient tension to hold the bag in place on the rim of a bin it is possible to have connection points between the strip and the bag between the ends of the strip to shorten the effective length of the elastic strip.

[0008] It is possible to use the elastic strip not only to hold the bag onto the open end of a bin but also to act as a tie to close the gathered together neck of the bag after it has been filled with rubbish. Typically, after the bag has been removed from the bin its neck is gathered together and then the elastic strip is pulled and wound around the gathered together neck of the bag with the final portion of elastic strip being formed into a loop and placed around the gathered together neck to seal the bag.

[0009] The elastic strip can be made from any material of high elasticity and low plasticity such as nat-

ural or synthetic rubbers or thermoplastic elastomers. The elastic strip can be used in the form of a tape or a thread. Where the elastic strip is adhered to the bag it is preferred to have the elastic strip in the form of a tape because of the larger contact surface of the tape to thereby ensure a better adhesion to the bag. The cross section of the elastic strip and its length will typically vary and be adapted to the dimensions of the bag to ensure that the strip provides a sufficiently tight grip on the top of the bin when it was located in a bin to hold the bag securely in place. Typically the maximum elongation of a typical elastic strip will be 800%. Accordingly, the minimum length between the attachment points is likely to be a seventh of the periphery of the open neck of the bag. However, preferably the length of the elastic strip is chosen in relation to the periphery of the bag to keep the elongation of the elastic strip to below 500% upon application of the strip to the rolled over top of the bag located in the bin.

[0010] When the elastic strip is in the form of a tape it has a thickness between 100 microns and 1 mm and a width between 2 and 10 mm. A typical example of such a tape has a thickness between 0.18 mm and 0.6 mm and a width of 1 mm to 6 mm and preferably 2 or 3 mm. One example of elastic tape found to be effective has a thickness of 0.3 mm and a width of 6 mm. When elastic threads such as Spandex are used they can vary in size from 500 to 1200 d/tex and can be used in single or multiple endages. One type of Spandex which is suitable is Lycra® made by E.I. du pont de Nemours and Company of 1007 Market Street, Wilmington, Delaware 19898, USA. When threads are made from natural or synthetic elastomers such as polyisoprene, polychloroprene, styrene butadiene polymers or blends of such polymers, then sizes will typically be in a range of 20 to 80 count. The count is the number of threads that can be cut from the elastic strip of width 1" (25.4 mm).

[0011] The bag may be made from PVC, polyethylene, polypropylene, or any other thermoplastic film or a combination of these. When the rubbish bag is made from a biodegradable plastics material it is especially preferred that the elastic strip is made from polyisoprene rubber which is also biodegradable.

[0012] The bag may be plain or gusseted and may include a tie or closure. In particular the bag may have a wavy configuration of top edge which provides portions of the top edge that can more easily be tied together to close the bag or, alternatively, be in the form of a so-called "bunny bag" which includes two integral carrying handles, usually formed in gusseted side regions of the bag, which also double as ties to close the filled bag. Another form of tie that is sometimes included in gusseted bags is a separate thin strip of plastics material which is laid in the outside of a gusset and retained in place by being sealed to the weld forming the base of such a gusseted bag. This type of tie is merely removed from the outside of the gusset when the bag is full and then used as a separate tie to wrap around and close

the gathered together neck of the filled bag. It is also common to provide separate closures in the form of metal-plastic or metal-paper strips. A further type of closure system that is in common use on rubbish bags is the type of rubbish bag which includes a folded over hem at its open end containing plastic draw tapes. Such draw tapes are exposed either at the top two corners of the bag or at recessed portions of the hem and are fitted to the bags as part of the bag manufacturing process. Such draw tapes may be fixed to the bag or be formed into a loop and merely held in the hem. When such a bag is full such draw tapes are then pulled to gather together the neck of the bag and then tied to close and seal the bag. This type of closure system provides a reliable closure system that forms part of the bag and therefore there is no risk of the tie being lost.

[0013] Preferably, only a single strip of elastic is provided which is attached at two spaced apart locations around the neck of the bag. Alternatively two separate strips of elastic are provided around the neck of the bag and each strip is fixed at two spaced apart locations. When more than one strip is provided they may be applied to one or both sides of the bag.

[0014] Particular examples of a bag in accordance with this invention will now be described with reference to the accompanying drawings, in which:-

Figure 1 is a diagrammatic perspective view of a first example of a bag;

Figure 2 is perspective view of the top part of the bag in place in a bin;

Figure 3 is a perspective view of the top part of the bag with the elastic beginning to be stretched; and, Figure 4 is a perspective view of the top part of the bag illustrating a first way of using the elastic strip to hold the bag in place;

Figure 5 is a perspective view of the top part of the bag illustrating a second way of using the elastic strip to hold the bag in place;

Figure 6 is a perspective view of the bag closed;

Figure 7 is a diagrammatic illustration of the way in which the first example of bag is manufactured;

Figure 8 is a perspective view of a second example of bag including a draw-string tie;

Figure 9 is a perspective view of the top part of the second example of bag in place in a bin;

Figure 10 is a perspective view of the top part of the second example of bag with the elastic beginning to be stretched;

Figure 11 is a perspective view of the top part of the bag with the elastic stretched to substantially as maximum extent and formed into a loop;

Figure 12 is a perspective view of the top part of the bag showing how the loop is placed around all of the turned over neck of the bag;

Figure 13 is a perspective view of a closed second example of bag immediately before the draw-strings are knotted; and,

Figures 14-19 are a series of perspective views illustrating how the second example of bag in accordance with this invention are manufactured.

[0015] A gusseted bag 1 of capacity 50 litres is made of polythene, has an open end 2 and a closed end including a weld 3. A piece of elastic strip 4 is fixed to the outside of one side of the bag 1 at each end by a hot melt adhesive 5 and is in a substantially relaxed state. Typically the elastic strip 3 is 0.18 mm thick 3 mm wide and has a relaxed length of 400 mm. The periphery of the neck of the bag is 1500 mm so that in its relaxed state the length of the strip of elastic 4 is substantially less than the peripheral length of the open end of the bag 1.

[0016] In use, the bag 1 is placed inside a rubbish bin 6 and the open end 2 turned over around the outside of the rim of a generally square rubbish bin 6 to form a loose collar 7. The elastic strip 4 is gripped by the user and pulled downwards as shown schematically in Figure 3 - and then lifted and stretched over the collar of the bag 1 to grip it and hold it in place on the bin 6 - as shown in Figure 4. In this way the elastic strip lies on the top of the collar 7 on three sides of the bin 6 and the tension in the elastic strip 4 holds the collar 7 tight on the fourth side of the bin. Alternatively the strip of elastic 4 is formed into a complete loop which is then placed around the entire collar 7 as shown in Figure 5.

[0017] Once the bag 1 has been filled with rubbish, the elastic strip 4 is released from around the collar 7 and the open neck 2 of the bag 1 is gathered together. The elastic strip 4 is pulled to tension it and then is wound around the gathered together neck 2 of the bag. The final remaining end or loop of the elastic strip 4 is placed over the gathered together neck 2 of the bag to hold it closed and to seal it, as shown in Figure 6.

[0018] To manufacture bags in accordance with the first example of this invention a blown tube of polyethylene film is first passed through a folding station in which the gussets are formed and then the gusseted tube is welded to provide the welds 3 at the bottom of each bag and perforated with perforations 8 to allow adjacent bags on a roll of such bags to be separated from one another by tearing along the perforations 8. At the next station the elastic strip 4 is fixed adjacent the perforations 8 by hot melt adhesive. The completed bags are then formed into a roll typically with the elastic strips 4 on the inside of the roll, ready for distribution and sale. It is possible in some situations to carry out the welding perforating and tape application step 4 all in a single operation by providing a single head which moves transversely across the tube of polyethylene.

[0019] The second example of bag is a non-gusseted bag including an integral tie and is shown in Figure 8. The second example of bag 11 includes an open top 12 and a base 13 formed by a fold of plastic material. Welded seams 14 are formed along each side edge of the bag. At the top edge of the bag 12 a turned over

hem 15 is formed and this turned over hem is welded to the side wall of the bag by a weld line indicated by reference numeral 16. Draw-tapes 17 are provided in the turned over hem 15 along each side and are welded to the bag at the welded seams 14. Cut-outs 18 are formed to enable the user to gain access to the draw-tapes 17. A piece of elastic 19 is fixed to the side wall of the bag 11 beneath the weld line 16 by a hot melt adhesive at attachment points 20. Typically the elastic strip 3 is 0.18 mm thick and 3 mm wide and has a relaxed length of 570 mm. The periphery of the neck of the bag is 1360 mm and thus the elastic strip is nearly half the periphery of the bag.

[0020] In use, the bag 11 is placed inside a rubbish bin 21 and the open end 12 is turned over around the outside of the rim of the rubbish bin 21 to form a loose collar 22. The elastic strip 19 is gripped by the user and pulled downwards as shown schematically in Figure 10 and then formed into a complete loop 23 as shown in Figure 11. This complete loop 23 is then placed around the entire collar 22 as shown in Figure 12. Once the bag 11 has been filled with rubbish the elastic strip 19 is released from around the collar 22 and the open neck 12 of the bag is then gathered together by pulling the draw tape 17 through the recesses 18. This results in the neck 12 of the bag 11 being gathered together as shown in Figure 13 and then the two loops of the draw tapes 17 can be formed into a knot to hold the bag closed and sealed.

[0021] A way of making the second example of a bag in accordance with this invention will now be described with reference to the diagrammatic Figures 14 to 19. Firstly, a tube 30 of blown polyethylene film is split longitudinally by slits 31 and 32 into two U-shaped portions 33 and 34. Each U-shaped portion is treated identically and, from now on only the treatment of one of these, portion 33, will be described. Firstly, perforated portions 35 are formed towards the cut edges and these perforated portions 35 will form the recesses 18 in the completed bag. Draw-tapes 17 are then placed adjacent the cut edges and then the cut edges folded over to form the hem 15 as shown in Figure 16. The folded over hems 15 are then welded by a weld line 16 to enclose the draw tapes 17 within the hem 15. The portion 33 is then divided into individual bags by forming a pair of weld lines 14 spaced by a perforation 36 as shown most clearly in the enlarged portion of Figure 18. Finally the elastic strip 19 is adhered to one side of the completed bags by hot melt adhesive at the attachment points 20. The completed bags are then formed into a roll, again with the elastic strip 19 on the inside of the roll before being packaged for distribution and sale. In use, the bags are separated from the roll by tearing them along perforation line 36.

Claims

1. A plastics bag (1) including at or towards its open

end (2) a strip of elastic (4) connected to the bag at two spaced apart portions (5), the elastic strip (4) extending between the spaced apart portions (5) extending over an extent of half the periphery or less of the bag (1), characterised in that the elastic strip is relaxed when the open end (2) of the bag (1) is opened to its maximum extent. 5

tie to close the gathered together neck (2) of the bag (1) after it has been filled with rubbish.

2. A bag according to claim 1, wherein the elastic strip (4) is attached to the outside surface of one side of the bag (1). 10
3. A bag according to claim 1 or 2, wherein the elastic strip (4) is attached by a hot melt adhesive and particularly a hot melt adhesive of the reactive or the rubbery elastomer type. 15
4. A bag according to any one of the preceding claims, wherein the elastic strip (4) is in the form of a tape having a thickness between 100 microns and 1 mm and a width between 2 and 10 mm, and preferably a thickness between 0.18 mm and 0.6 mm and a width between 1 mm and 6 mm. 20
5. A bag in accordance with any one of the preceding claims, which also includes a tie (17) connected to, or forming part of the bag (1), to close and seal it. 25
6. A bag according to claim 5, which includes a folded over hem (15) at its open end (12) containing plastic draw tapes (17), which are usable to gather together the neck of the bag (11) and then be tied to close and seal the bag (11). 30
7. Use of a bag in accordance with any one of the preceding claims, wherein the bag (1) is placed in a bin (6) and the open neck (2) of the bag (1) is folded over the open end of the bin (6), the strip of elastic (4) then being pulled over and across the open end of the bin to engage the folded over neck portion (7) on the opposite side of the bag (1). 35 40
8. Use of a bag in accordance with claim 7, wherein the elastic strip has a length of half, or approaching half, of the periphery of the neck (2) of the bag (1) and wherein the elastic strip (4) is formed into a complete loop which is then placed completely to surround the folded over neck (7) of the bag (1). 45
9. Use of a bag in accordance with claim 7, wherein the strip only extends around the remainder of the periphery of the folded over end (7) of the neck of the bag (1) with the exception of that between the direct path between the connection points (5) of the elastic strip (4). 50 55
10. Use of a bag in accordance with any one of the preceding claims, wherein the elastic strip (6) acts as a

Fig.1.

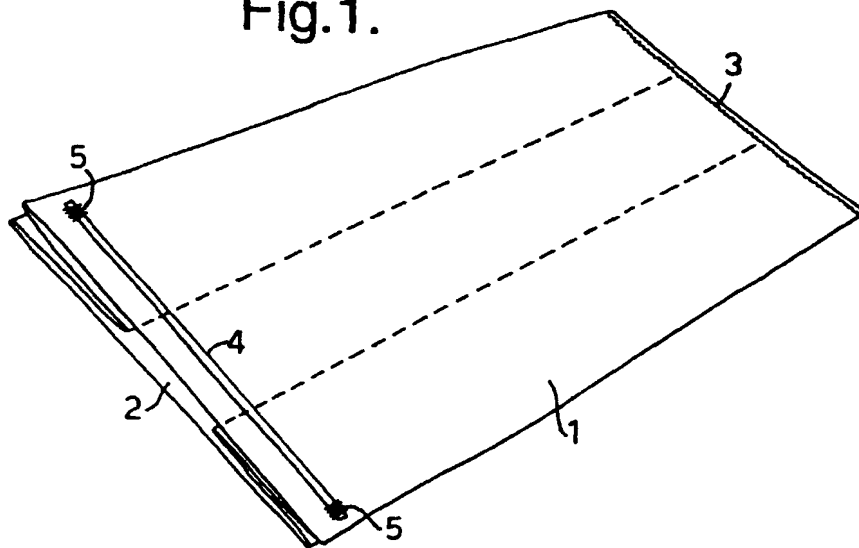


Fig.6.

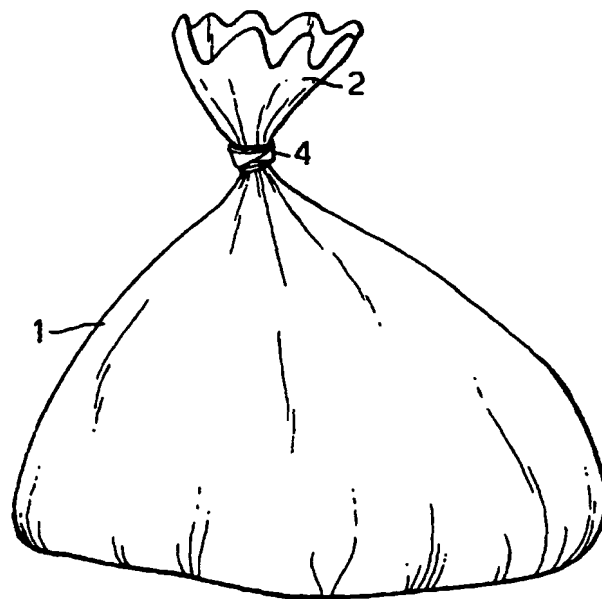


Fig.2.

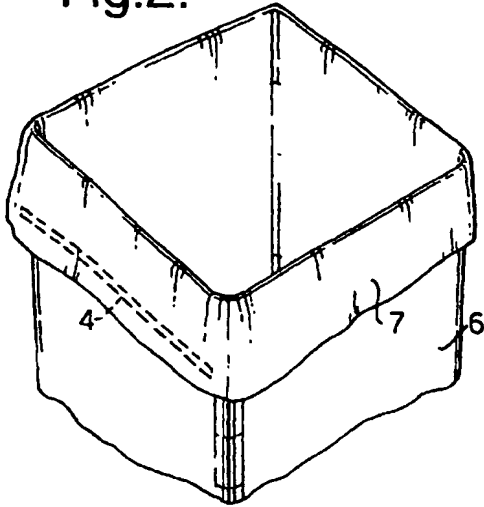


Fig.3.

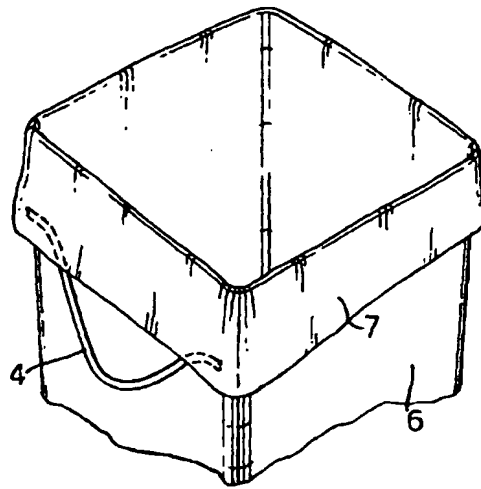


Fig.4.

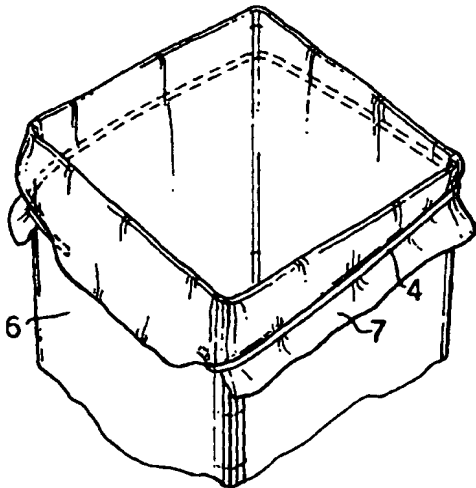


Fig.5.

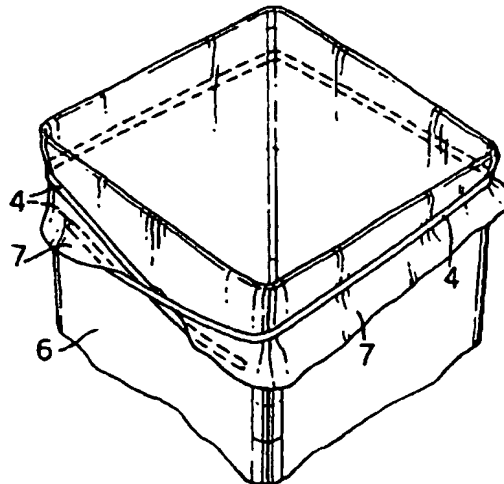


Fig.7.

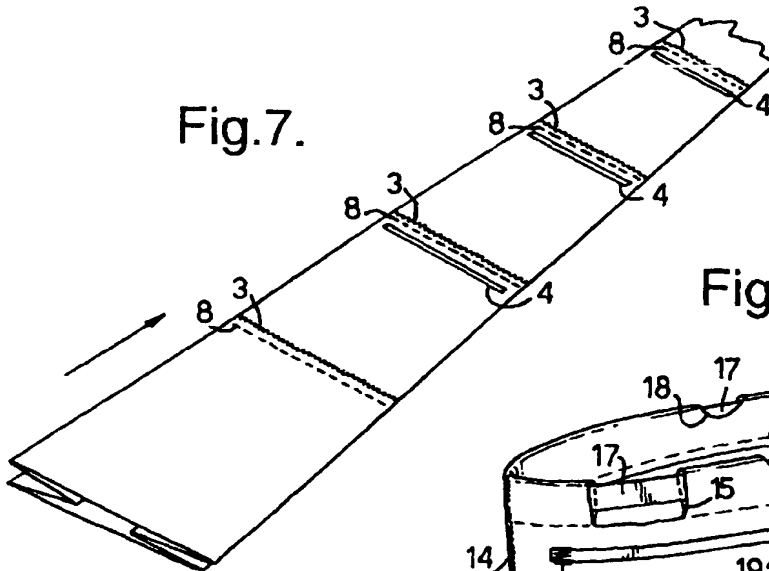


Fig.8.

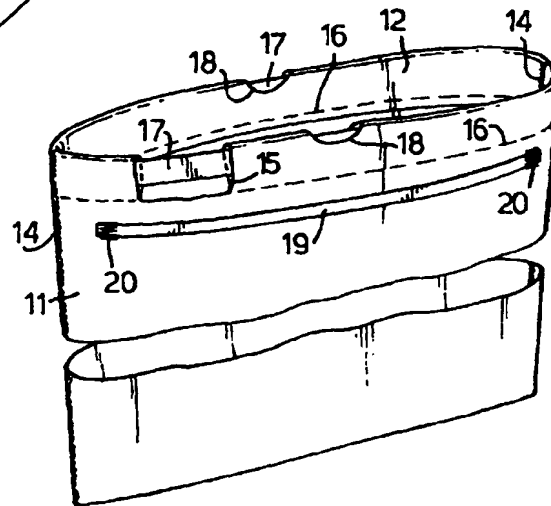


Fig.9.

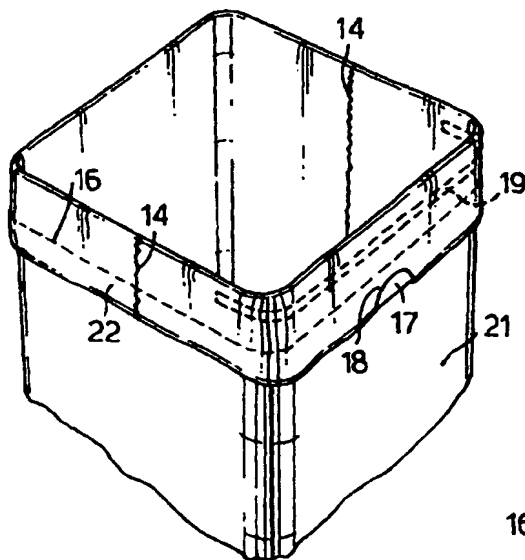


Fig.10.

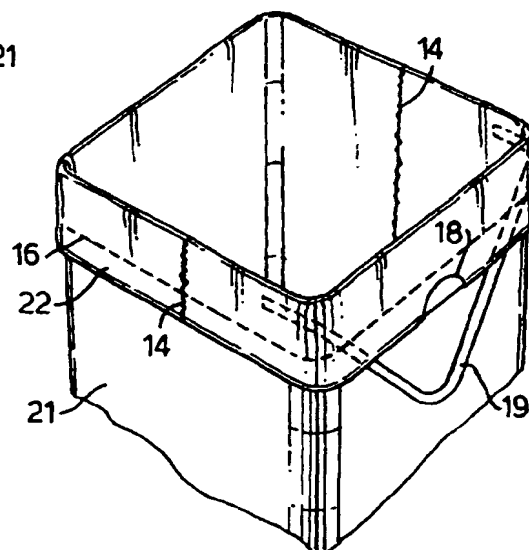


Fig.11.

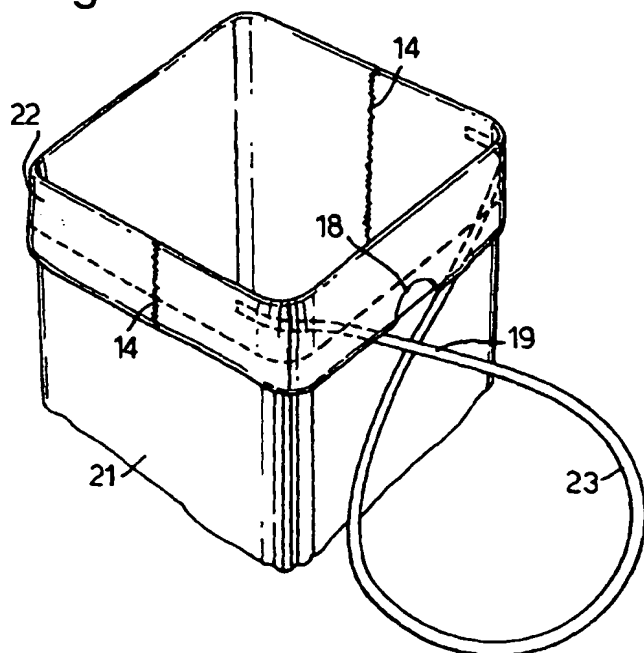


Fig.12.

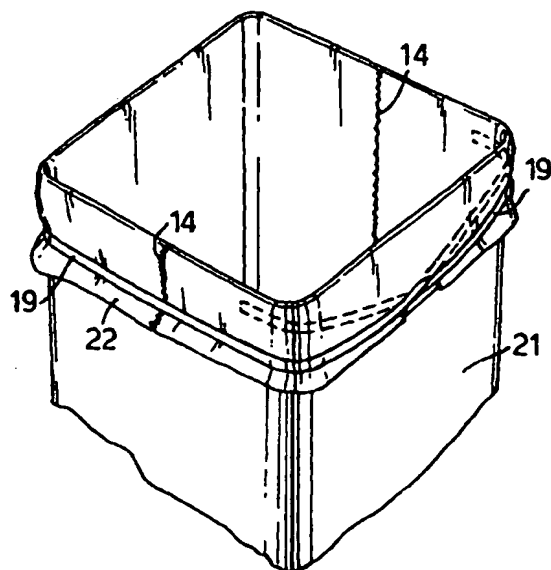


Fig.13.

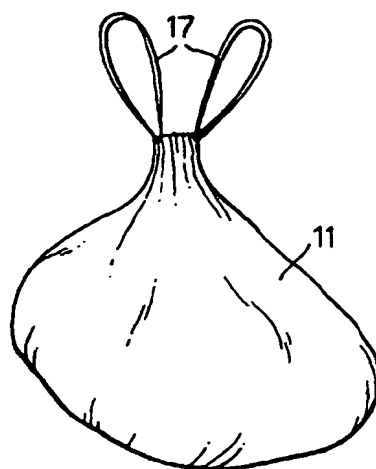


Fig.14.

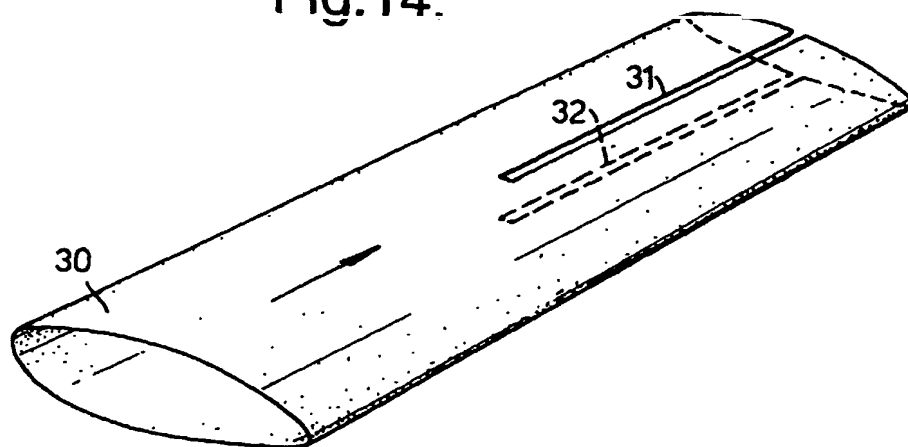


Fig.15.

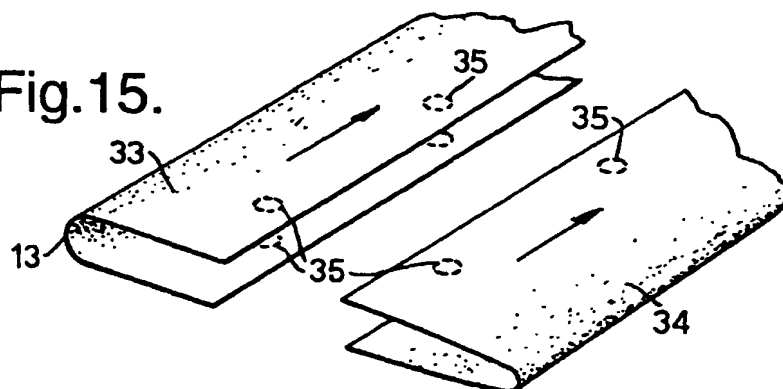


Fig.16.

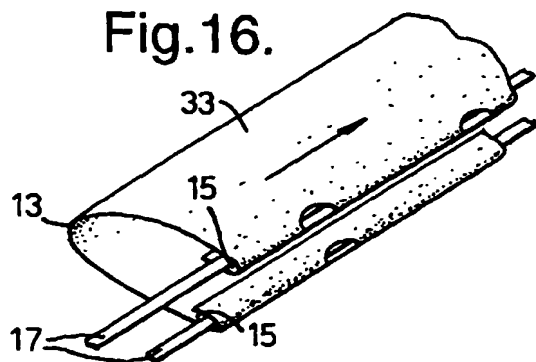


Fig.17.

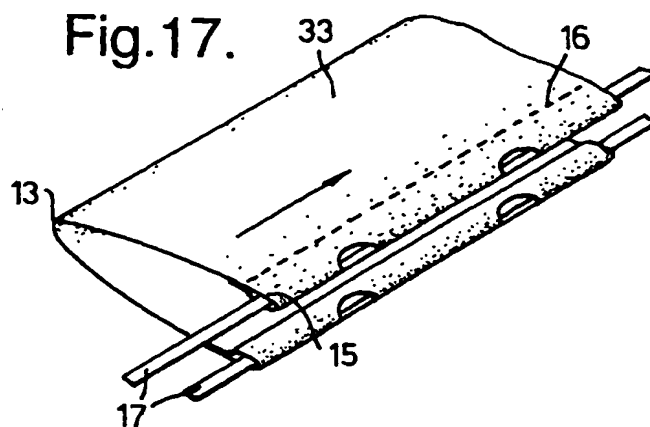


Fig.18.

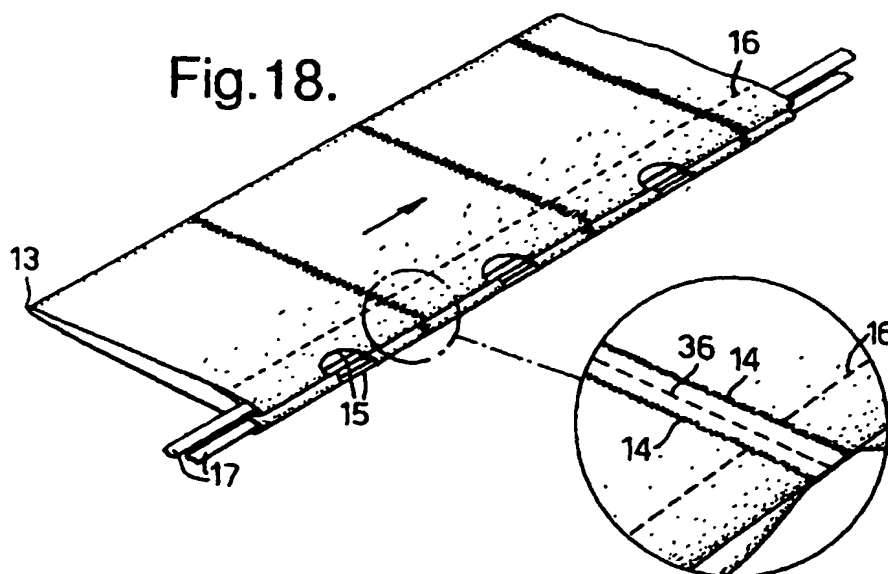
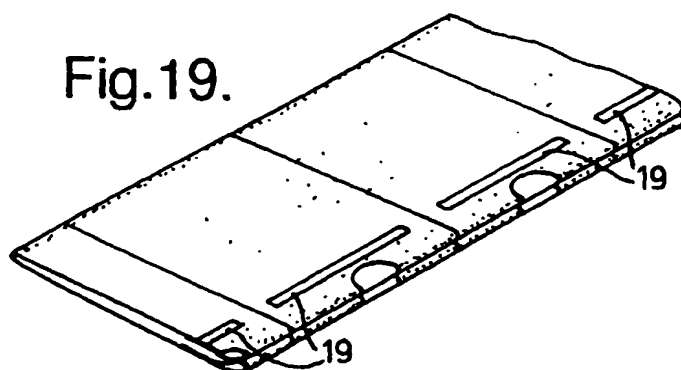


Fig.19.





European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 98 31 0654

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The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 21 May 1999	Examiner Smolders, R
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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